

Claims

1. An injection valve (1) with a valve control module (2) and an attached nozzle module (3), which has a nozzle needle (12) that is disposed so that it can move axially in a nozzle body (13), wherein the valve control module (2) adjoins the nozzle module (3) with a throttle plate (14) and, in the region of an end of the nozzle needle (12) oriented toward the throttle plate (14), an intermediate element (21) is provided, which is pressed against the throttle plate (14) by means of a spring (18) that is disposed between the intermediate element (21) and the nozzle needle (12) and exerts an axial force on the nozzle needle (12) in the closing direction, wherein at least one outlet throttle (24) is provided in the throttle plate (14) and at least one inlet throttle (23) connected to a high-pressure region (9) is provided, both of which throttles feed into a valve control chamber (22), characterized in that on its side oriented toward the nozzle module (3), the throttle plate (14) has an enclosed raised area (26) that delimits an inner chamber (25), constitutes a delimitation for the valve control chamber (22), and contains the inlet throttle (23).
2. The injection valve according to claim 1, characterized in that the intermediate element (21) is embodied as a spring plate, which rests against the end surface (28) of the raised area (26) on the throttle plate (14) oriented toward the nozzle module (3).
3. The injection valve according to claim 1 or 2, characterized in that the nozzle needle (12) of the nozzle module (3) is guided in a guide (41) of the intermediate

element (21) and when the nozzle module (3) opens, moves axially in the guide (41) of the intermediate element (21) so that the end (12A) of the nozzle needle (12) oriented toward the throttle plate (14) engages in an inner chamber (25) of the raised area (26).

4. The injection valve according to one of claims 1 to 3, characterized in that in the region of the intermediate element (21), the nozzle needle (12) has a shoulder (32), which, upon execution of a definite stroke path of the nozzle needle (12) during an axial movement of the nozzle needle (12) to open the nozzle module (3), comes to rest against the side of the intermediate element (21) oriented away from the throttle plate (14).

5. The injection valve according to one of claims 1 to 4, characterized in that the end surface (28) of the raised area (26) oriented toward the intermediate element (21) is embodied with a conical cross section so that a linear contact is produced between the raised area (26) and the intermediate element (21).

6. The injection valve according to one of claims 1 to 5, characterized in that a disk (19) for adjusting a spring force of the spring (18) is provided between an end of the spring (18) oriented away from the throttle plate (14) and a shoulder (20) of the nozzle needle (12).

7. The injection valve according to one of claims 1 to 6, characterized in that a recess (13) is provided in the throttle plate (14) at a transition between the raised

area (26) and an end surface (27) of the throttle plate (14) oriented toward the intermediate element (21).

8. The injection valve according to one of claims 3 to 7, characterized in that the guide (41) of the intermediate element (21) for the nozzle needle (12) is matched to a guide (40) of the nozzle body (13) of the nozzle module (3) for the nozzle needle (12).

9. The injection valve according to one of claims 1 to 8, characterized in that a ratio is set between a diameter of the outlet throttle (24) and a diameter of the inlet throttle (23) as a function of a pressure in the valve control chamber (22) at which the nozzle module (3) opens.

10. The injection valve according to one of claims 1 to 9, characterized in that the raised area of the throttle plate positively engages in at least some areas with a device of the nozzle module to permit radial adjustment of the control module in relation to the nozzle module.